

Improving the Oral Health Status of All Americans: Roles and Responsibilities of Academic Dental Institutions

The Report of the ADEA President's Commission*

N. Karl Haden, Ph.D.; Frank A. Catalanotto, D.M.D.; Charles J. Alexander, Ph.D.; Howard Bailit, D.M.D., Ph.D.; Ann Battrell, R.D.H., B.S.; Jack Broussard, Jr., D.D.S.; Judith Buchanan, Ph.D., D.M.D.; Chester W. Douglass, D.M.D., Ph.D.; Claude Earl Fox III, M.D., M.P.H.; Paul Glassman, D.D.S., M.A., M.B.A.; R. Ivan Lugo, D.M.D., M.B.A.; Mary George, R.D.H., M.Ed.; Cyril Meyerowitz, D.D.S., M.S.; Edward R. Scott II, D.M.D.; Newell Yapple, D.D.S.; Jack Bresch, M.A.L.S.; Zlata Gutman-Betts, M.A.; Gina G. Luke, B.S.; Myla Moss, M.A., M.S.W.; Jeanne C. Sinkford, D.D.S., Ph.D.; Richard G. Weaver, D.D.S.; Richard W. Valachovic, D.M.D., M.P.H.

Abstract: Academic dental institutions are the fundamental underpinning of the nation's oral health. Education, research, and patient care are the cornerstones of academic dentistry that form the foundation upon which the dental profession rises to provide care to the public. The oral health status of Americans has improved dramatically over the past twenty-five to thirty years. In his 2000 report on oral health, the Surgeon General acknowledges the success of the dental profession in improving the oral health status of Americans over the past twenty-five years, but he also juxtaposes this success to profound and consequential disparities in the oral health of Americans. In 2002, the American Dental Education Association brought together an ADEA President's Commission of national experts to explore the roles and responsibilities of academic dental institutions in improving the oral health status of all Americans. They have issued this report and made a variety of policy recommendations, including a Statement of Position, to the 2003 ADEA House of Delegates. The commission's work will help guide ADEA in such areas as: identifying barriers to oral health care, providing guiding principles for academic dental institutions, anticipating workforce needs, and improving access through a diverse workforce and the types of oral health providers, including full utilization of allied dental professionals and collaborations with colleagues from medicine.

Dr. Haden is Associate Executive Director and Director, ADEA Center for Educational Policy and Research; Dr. Catalanotto is Professor, Department of Pediatric Dentistry, University of Florida College of Dentistry; Dr. Alexander is Associate Dean for Student Affairs, University of California, San Francisco School of Dentistry; Dr. Bailit is Professor Emeritus and Director, University of Connecticut Health Policy Center; Ms. Battrell is Director, Dental Hygiene Education, American Dental Hygienists Association; Dr. Broussard is a general dentist in South Pasadena, CA; Dr. Buchanan is Associate Dean for Academic Affairs, University of Pennsylvania School of Dental Medicine; Dr. Douglass is Chair, Oral Health Policy and Epidemiology, Harvard School of Dental Medicine; Dr. Fox is Director, Johns Hopkins Urban Health Institute; Dr. Glassman is Associate Dean for Information and Education Technology and Director, Advanced General Dentistry Residency, University of the Pacific School of Dentistry; Dr. Lugo is Associate Dean for Institutional Relations and Community Affairs and Acting Chair, Department of Dental Informatics, Temple University School of Dentistry; Prof. George is Director, Allied Dental Educational Programs, University of North Carolina-Chapel Hill School of Dentistry; Dr. Meyerowitz is Chair and Director, University of Rochester School of Medicine and Dentistry; Dr. Scott is Immediate Past President, National Dental Association and a general and cosmetic dentist in Tallahassee, FL; Dr. Yapple is an oral and maxillofacial surgeon and Past President, AADE; Mr. Bresch is Associate Executive Director and Director, ADEA Center for Public Policy and Advocacy; Ms. Gutman-Betts is Program Manager, ADEA Center for Educational Research; Ms. Luke is Director, State Government Relations and Advocacy Outreach, ADEA Center for Public Policy and Advocacy; Ms. Moss is Director, Congressional Relations, ADEA Center for Public Policy and Advocacy; Dr. Sinkford is Associate Executive Director and Director, ADEA Center for Equity and Diversity; Dr. Weaver is Associate Director, ADEA Center for Educational Research; and Dr. Valachovic is ADEA Executive Director. Direct correspondence to Dr. N. Karl Haden, ADEA, 1625 Massachusetts Ave, N.W., Washington, DC 20036; 202-667-9433 phone; 202-667-0642 fax; hadenk@adea.org.

Academic dental institutions are the fundamental underpinning of the nation's oral health. As educational institutions, dental schools, allied dental education, and advanced dental education programs are the source of a qualified workforce, influencing both the number and type of

oral health providers. As centers of discovery, academic dental institutions ensure that oral health practice evolves through research and the transfer of the latest science. As providers of care, academic dental institutions are a safety net for the underserved, centers of pioneering tertiary care, and contributors to

*The commission was appointed in 2001 by ADEA President Pamela Zarkowski and continued its work through 2002 with Dr. David Johnsen as ADEA President. The commission was chaired by Dr. Frank A. Catalanotto.

the well-being of their communities through accessible oral health care services. The interlocking missions of education, research, and patient care are the cornerstones of academic dentistry that form the foundation upon which the dental profession rises to provide care to the public.

The oral health status of Americans has improved dramatically over the past twenty-five to thirty years. Successive cohorts of the population by age are experiencing less dental disease. The mean number of decayed, missing, or filled surfaces of teeth of U.S. children ages five to seventeen has declined from 7.1 to 2.5. Approximately 55 percent of children five to seventeen have had no tooth decay in their permanent teeth,¹ and the number of school-aged children receiving dental sealants has increased in recent years.² The mean number of teeth present in adults ages eighteen to seventy-four has trended upwards in all age groups. The percent of all adults who are edentulous has fallen from 14.7 to 7.7 percent.¹ Over the past twenty years, deaths resulting from oral and pharyngeal cancers have declined by nearly 25 percent, and new cases have declined by 10 percent.¹ Community water fluoridation is hailed as one of the great public health achievements of the twentieth century.

Oral Health in America: A Report of the Surgeon General, published in the year 2000, is a landmark in the history of oral health. For the first time, the Surgeon General of the United States identified oral health as integral to general health, saying: "Oral health is a critical component of health and must be included in the provision of health care and the design of community programs."¹ Table 1 provides a summary of the report's major findings. The Surgeon

General acknowledges the success of the dental profession, but juxtaposes this success with profound and consequential disparities in the oral health of Americans.

As indicated in the Surgeon General's report, the burden of oral diseases and conditions is disproportionate among the United States population (Appendix 1). Other recent reports corroborate these findings.^{2,4-6} Underserved individuals and families living below the poverty level experience more dental decay and are more likely to have untreated teeth than those who are economically better off. Black/African Americans and Hispanic/Latinos have higher proportions of untreated teeth than their white counterparts. A higher proportion of lower income individuals, at all ages, have evidence of gingivitis and periodontal disease than do middle or higher income individuals. A higher percentage of individuals below the poverty level are edentulous than those above. Elderly, disabled, and medically compromised populations have a disproportionate amount of oral disease, from dental caries to periodontal disease and oral cancer. Oral cancer is the sixth most common cancer in U.S. males and ranks as the fourth most common cancer among African American men.⁷ While water fluoridation is a proven means to reduce dental caries, many areas of the country remain unfluoridated, resulting in poorer oral health in those communities. Moreover, dental caries are far from eradicated even in fluoridated communities.

While the adequacy of the aggregate number of dentists to meet the nation's oral health needs is unclear, disparities are prominently reflected in the geographical distribution of dentists. The number of Dental Health Professions Shortage Areas designated by the U.S. Health Resources and Services Administration (HRSA) Bureau of Health Professions has grown from 792 in 1993 to 1,895 in 2002. In 1993, HRSA estimated that 1,400 dentists were needed in these areas; by 2002, the number of dentists needed had grown to more than 8,000. More than 40,122,000 people live in Dental Health Professions Shortage Areas.⁸

State legislatures are increasingly turning to alternatives to the current delivery system to address access issues for underserved populations. For example, the California legislature has mandated that the State Board of Dental Examiners certify foreign dental schools so their graduates can take the state licensing examination.⁹ More recent legislation in California mandates that the state board bring Mexican dentists into California to work in underserved settings.¹⁰ Over the past decade, many states have

Table 1. Major findings of the surgeon general's report

- Oral diseases and disorders in and of themselves affect health and well-being throughout life.
- Safe and effective measures exist to prevent the most common dental diseases—dental caries and periodontal diseases.
- Lifestyle behaviors that affect general health such as tobacco use, excessive alcohol use, and poor dietary choices affect oral and craniofacial health as well.
- There are profound and consequential oral health disparities within the U.S. population.
- More information is needed to improve America's oral health and eliminate health disparities.
- The mouth reflects general health and well-being.
- Oral diseases and conditions are associated with other health problems.
- Scientific research is key to further reduction in the burden of diseases and disorders that affect the face, mouth, and teeth.

addressed access by increasing the use of dental hygienists, permitting hygienists to provide care in specific settings under unsupervised practice or less restrictive supervision.¹¹

In 2002, the American Dental Education Association (ADEA) brought together a commission of national experts to explore the roles and responsibilities of academic dental institutions in improving the oral health status of all Americans. This report is based upon their deliberations. While not intended to provide an exhaustive analysis of the plethora of issues and studies related to the growing access to oral health care problem, this report provides the background for the Statement of Position and other policy recommendations proposed by the commission to ADEA.

The report is organized around the following major themes:

1. Need and Demand: Identifying Barriers to Oral Health Care
2. Access to Oral Health Care: Guiding Principles for Academic Dental Institutions
3. Anticipating Workforce Needs
4. The Patient Care Mission of Academic Dental Institutions
5. Improving Access Through a Diverse Workforce
6. Removing Barriers to a More Diverse Workforce
7. Types of Oral Health Providers

In its conclusion, the report contains a series of recommendations in five different areas with the purpose of focusing academic dentistry on a common set of strategies to improve the oral health of all Americans, especially the underserved.

Need and Demand: Identifying Barriers to Oral Health Care

The Surgeon General's Report demonstrates the need for oral health care and the impact of poor oral health on individuals, communities, and society at large (Appendix 1). As the term is used in this report, *need* for oral care is based on whether an individual requires clinical care or attention to maintain full functionality of the oral and craniofacial complex. The disproportionate burden of oral diseases and disorders indicates that specific population groups are in greater need of oral health care. *De-*

mand is generally understood as the amount of a product or service that users can and would buy at varying prices. The extent of oral health care disparities clearly indicates that many of those in *need* of oral health care do not *demand* oral health care. While universal access to oral health care is frequently identified as an admirable goal, practical considerations often lead to the conclusion that it is, in fact, unattainable given present resources. Currently in the United States, the provision of health care services, including oral health care services, is treated like a manufactured commodity, with access, price, and quality subject to the incentives that dictate a competitive marketplace. In such a marketplace economy, the variety of factors influencing demand gives way to one major factor: the ability to pay for services rendered.

Health care, and by implication, oral health care, should be treated differently than marketplace commodities. First, oral health is a part of general health. Health is a human good experienced by all humans, vital to human flourishing and basic to the pursuit of life, liberty, and happiness. Secondly, the science and knowledge about oral health is not the property of any individual or organization; rather, society grants individuals the opportunity to learn at academic dental institutions with an assumed contract that this knowledge will benefit the society that granted the opportunity to obtain it. Thirdly, the practice of all health care is based on the commitment to the good of the patient. To ensure that those in need receive care, attention must focus on the variety of barriers that limit access to oral health care and thereby negatively affect demand, barriers such as:

Knowledge and Values

- Those in need of oral health care lack knowledge about the prevention of oral health diseases and awareness of their clinical need.^{1,4}
- The general public often does not appreciate the importance of oral health and perceives it as independent from and secondary to general health.^{1,4}
- Many public policymakers do not understand or value oral health as a part of general health and healthcare, thereby marginalizing oral health to a policy issue of lower priority.^{1,4,13}

Availability of Care

- Many in need do not have access to a provider within their community due to the maldistribution of dentists, the consequent geographic disparity of oral health providers, and other factors as noted below.^{1,5,8,14}

- Many underserved population groups cannot secure an appointment with an oral health provider because some oral health providers are unwilling to care for the underserved due to low reimbursement rates, lack of insurance, insufficient practice capacity to accept additional patients, and other factors.¹⁵⁻¹⁷
- Much of the oral health workforce is unprepared to render culturally competent care to racially and ethnically diverse populations, to people with complex medical and psychosocial conditions or developmental and other disabilities, to the very young, and to the aged.¹⁷⁻¹⁹

Ability to Pay and Lack of Insurance

- Because of their economic status, some underserved are unable to pay for oral health care services.²⁰⁻²³
- Most underserved groups lack dental insurance.^{1,4,21,22}
- Low reimbursement rates for public programs such as Medicaid and the State Children's Health Insurance Program (SCHIP) dissuade providers from rendering care to the poor and to children.²⁰⁻²⁵
- Nearly 75 percent of dentists do not treat Medicaid-insured patients.²⁶
- Because dental care is not covered by Medicare, many of the elderly are deterred from seeking oral health care.^{19,24,25}

Regulatory Considerations

- Most state laws and regulations restrict access to care by limiting the type of practice settings and imposing restrictive supervision requirements on allied dental personnel, limits and requirements that are incommensurate with the education and experience of many allied dental professionals.^{6,27,28}

Systemic Barriers within Health Care Delivery

- The underlying barrier to good oral health for the underserved is an oral health care system that has changed little over the past century. The traditional model of oral and dental care, namely that of the solo practice dentist assisted by allied dental personnel providing care under the dentist's supervision, is no longer adequate to address the nation's oral health needs.^{1,23}

As academic dental institutions, the dental profession, policymakers, and other stakeholders reconsider the delivery system, the traditional model of oral and dental care will continue to serve an important role in meeting the nation's oral health needs;

but a number of other models must be supported, developed, and employed to ensure oral health care for all Americans. The separation of oral health from systemic health in the U.S. health care system has resulted in a disciplinary chasm between oral health providers and the rest of medical care to the detriment of the patient, especially the underserved. This system must be challenged and changed. Academic dental institutions provide not only an alternative model through their clinics, but they also play a basic role in developing new models and recruiting future providers to work within these practice settings.

Access to Oral Health Care: Guiding Principles for Academic Dental Institutions

The goal of ensuring access to oral health care for all Americans follows from the concept of the American society as a good society, from the role of academic dental institutions in meeting the common good, and from the moral responsibilities of the professional community of oral health providers. The good society can be understood as one that relies on a moral infrastructure—families, schools, faith communities, and other institutions—and informal social controls to promote substantive values.^{29,30} Members of the good society are expected to contribute to causes that improve all of society rather than merely acting out of self-interest. Social institutions such as family and schools help to form the backbone of the good society. While the United States does not always meet these expectations, arguably it was the intention of the Founders and remains a national purpose that both our leaders and other members of society fulfill social responsibilities for the good of the whole.

As noted, schools play a fundamental role in the good society. In reflecting on the history of higher education in the United States, Rudolph observes that "The American college was conceived as a social investment. . . . Social purpose might also be defined as national purpose. A commitment to the republic became a guiding obligation of the American college."³¹ As professional schools, including academic dental institutions, became a part of universities, they too accepted the responsibility to serve the common good.³² In recent years, this social purpose has come under scrutiny from the public who often perceive the university's self-interest as outweighing

the concern for the public good.³³⁻³⁵ DePaola attributes the lack of an identifiable, public good agenda as one reason for the public's loss of confidence in higher education. He observes that both the university and the dental school, and by implication, other academic dental institutions, must establish goals for the common good, which include improving access to oral health care.³⁶

At the 1998 American Association of Dental Schools Leadership Summit Conference, Hershey used the metaphor of the dental school as the "front porch" to the university, a component of the university that has extensive contact with the public and substantial potential for public service.³⁷ As the front porch of their parent institutions, academic dental institutions improve the oral health of all Americans by providing patient care, teaching prevention in community settings, conducting and translating research to the benefit of their communities and the nation, partnering with community leaders, including those in organized dentistry, to promote and provide care, and advocating for oral health at the local, state, and national levels. The most obvious role of academic dental institutions in meeting community, state, and national oral health needs is educating future oral health professionals. However, a major aspect of the educational process is sometimes overlooked or at least underemphasized, namely, teaching the values that prepare the student to enter a morally responsible profession.

Pellegrino refers to the medical profession as a "moral community." By implication, the dental profession, including allied dental groups, also constitutes a moral community, "one whose members are bound to each other by a set of commonly held ethical commitments and whose purpose is something other than mere self-interest." Pellegrino maintains that moral purpose arises from the nature of the activity in which the members of the community engage. He delineates four aspects of medicine, *which apply equally to dentistry*, as a special kind of human activity that gives moral status to individual members and collectively to the profession:³⁸

1. **Vulnerability and inequality.** The vulnerability of the sick person and the consequent inequality that it produces into the provider-patient relationship is a fundamental result of illness. Without access to special knowledge and skill, the person in need loses freedom to pursue life's goals, to make his or her own decisions, and to help oneself. The provider has a professional and moral obligation to protect the patient in this

vulnerable condition and to act in the best interest of the patient.

2. **The nature of medical decisions.** Medical decisions, including those made by dental professionals, are both technical and moral. In seeking the patient's good, the provider must respect the patient's moral beliefs and requests. At times, the provider is confronted with a conflict between the patient's physical well-being and the patient's values. Providing culturally competent care is an example of the unique interaction between technical skill and personal values that belong to the healing professions.
3. **The nature of medical knowledge.** The nature of medical knowledge creates an obligation in those who acquire and possess it. First, it is practical knowledge for the express purpose of caring for the sick. Secondly, through health professions education, especially that in the context of clinical care and its accompanying risks and opportunities, society grants the health professional the privilege to obtain special knowledge. Society also funds health professions education in unique ways, substantially different from its funding of other areas of higher education and professional education. There is an assumed contract between the learner and society that this knowledge will benefit the society that granted the opportunity to obtain it. Lastly, as with the medical professions, the dental professions manage knowledge and its application through accreditation and by establishing standards and institutions that safeguard the public.
4. **Moral complicity.** Pellegrino observes, "No order can be carried out, no policy observed, and no regulation imposed without the physician's assent. . . . He is inescapably the final safeguard of the patient's well being. The physician is therefore de facto a moral accomplice in whatever is done that adversely affects his patient."³⁸ In the realm of oral health care, such moral complicity also characterizes the place of the dentist.

What do these four aspects mean for academic dentistry? Academic dental institutions are a part of this moral community. In the teacher-student relationship, academic dental institutions play a fundamental role in inculcating values that frame the dental profession's societal obligations. Academic dental institutions must prepare students to enter the oral health care profession as a member of a moral community. Being a part of this community not only means placing the interest of the patient above economic self-interest, but also participating in the organized profession.

While each dentist and each allied dental professional has a role to play in improving access, the organized dental and allied dental profession, including dental academia, must assume the leadership role in addressing access to oral health care for all Americans. Acting as a moral community, the organized professions of oral health providers have tremendous influence on state and federal policymakers, community leaders, industry, and other stakeholders to help the profession fulfill its moral duties. As part of fulfilling this public trust, the American Dental Association (ADA) in its Code of Ethics and Professional Conduct expresses the concept that “the dental profession should actively seek allies throughout society on specific activities that will help improve access to care for all.”³⁹ The Pew Health Professions Commission in its list of competencies for the twenty-first century emphasizes a personal ethic of social responsibility and service as part of the larger issues of professional responsibility and social justice essential to improving the health of all groups of society.⁴⁰

Recent activities by the ADA such as Give Kids a Smile National Children’s Dental Access Day⁴¹ and advocacy for dental access legislation are examples of how organized dentistry can improve care for the underserved.⁴²⁻⁴³ New Mexico enacted legislation to improve access through “collaborative practice,” allowing dental hygienists to treat patients in a variety of settings according to a protocol with a consulting dentist.⁴⁴ Another example, the Robert Wood Johnson Foundation (RWJF) \$19 million Pipeline, Profession, and Practice: Community-Based Dental Education project is a partnership between a private foundation and dental schools to expand existing initiatives and to develop new ones for long-term impact on access to oral health care.⁴⁵ Academic dental institutions have a responsibility to develop the next generation of leaders for organized dentistry and the organized allied dental professions so that such efforts continue and grow in frequency and impact.

Guiding principles as a philosophy of oral health care have an enduring quality that transcends immediate problems and issues to shape the beliefs and values of the academic dental community and the professionals it educates. The following general principles are proposed to guide academic dental institutions in pursuit of their missions of education, research, and outreach to improve the oral health status of all Americans:

- **Access to basic oral health care is a human right.** A human right is a claim that persons have

on society by virtue of their being human. In the good society, individuals have a moral claim to oral health because oral health is a necessary condition for the attainment of general health, well-being, and the pursuit of other basic human rights acknowledged by the society as its aims and to which, therefore, the society is already committed. The corollary of a right is a duty. The duty to ensure basic oral health for all Americans is a shared duty that includes federal, state, community, public, and private responsibilities. The dental profession, including academic dental institutions, as the moral community entrusted by society with knowledge and skill about oral health, has the duty to lead the effort to ensure access for all Americans.

- **The oral health care delivery system must serve the common good.** Society grants the health professions a large degree of self-regulation and governance. In return, there is an implicit contract and obligation to serve the public good. Professionalism demands placing the interest of patients above those of the profession. Economic market forces, societal pressures, and professional self-interest must not compromise the contract of the oral health provider with society. The objective of the oral health care system should be a uniform basic standard of care accessible to all.
- **The oral health needs of vulnerable populations have a unique priority.** Every person has intrinsic human dignity. Oral health professionals must individually and collectively work to improve access to care by reducing barriers. The equitable provision of oral health care services demands a commitment to the promotion of public health, prevention, public advocacy, and the exploration and implementation of new models that involve each oral health professional in the provision of care.
- **A diverse and culturally competent workforce is necessary to meet the oral health needs of the nation.** The workforce of the future must be prepared to meet the needs of a diverse population. Academic dental institutions, as the source of oral health professionals, have a distinct responsibility to educate dental and allied dental professionals who are competent to care for the changing needs of our society. This responsibility includes preparing providers to care for an aging population, a racially and ethnically diverse population, and individuals with special needs. In so doing, academic dental institutions can anticipate and address unmet oral health needs in underserved populations.

These guiding principles are reflected in the major considerations that follow for improving the oral health status of all Americans.

Anticipating Workforce Needs

The ADA, in its 2001 report on the *Future of Dentistry*,⁴⁶ projected that the ratio of professionally active dentists to population would continue to decline from its peak of 60.2 per 100,000 in 1994 to 54.2 per 100,000 in 2020. However, the ADA report stated that due to expected annual increases in the productivity of the dental workforce, "The national supply of dental services is likely to increase . . . that a major increase in the aggregate number of dentists is probably not necessary at this time."⁴⁶ Added to this projection is an expectation that, with changing disease patterns and continuing improvements in the oral health of the population, fewer dentists will be required to manage the oral health care needs of even an expanding population.

Responding to a 1994 ADA-projected decline in the dentist to population ratio, the Institute of Medicine (IOM), Committee on the Future of Dental Education, in its 1995 report *Dental Education at the Crossroads*, stated that it found no compelling evidence that would allow it to recommend with confidence that dental school enrollments be increased.⁴⁷ The committee concluded that workforce planning would have to proceed with caution: that while the ratio of dentists to population was declining, there was an unestimated inherent productive capacity within the dental sector to meet increases in demand. It was also acknowledged that the history of stimulating the supply of health care providers showed little effect on reducing shortage areas or improving access to care by special or underserved populations.

The conclusions reached in the ADA and IOM reports reflect aggregate workforce numbers and capabilities. Missing from these aggregate efforts and conclusions is the evident issue that a sizable portion of the population has difficulty availing itself of needed or wanted oral health care, regardless of the current or projected number of dentists or of current or projected levels of their productivity. Missing from the various workforce scenarios is an ostensible concern in fulfilling a public trust: the professional obligation and responsibility to provide competent care for a diverse population and to improve the oral health of all groups of society.

Over the past forty years, dental schools have responded to federal construction and capitation grants, perceived shortages and surpluses of dentists, and increases and decreases in dental school applicants. The number of graduates rose almost 81 percent from 3,181 in 1965 to a peak of 5,756 in 1984. But by 1993, the number of graduates had fallen by over 34 percent to stand at 3,778 graduates, a decline that can be attributed in large part to the closure of six private dental schools between 1984 and 1994. In 2001, Northwestern University graduated its last class and closed its dental school. Two new dental schools have opened since 1997, bringing the total to fifty-five accredited dental schools, with another dental school planned to open in 2003. Through the two new dental schools and increases in dental school enrollments, the number of graduates has grown almost 16 percent from a low of 3,778 in 1993 to 4,367 in 2001.

Dental schools are located in thirty-four states, plus the District of Columbia and Puerto Rico. While sixteen states are without a dental school, many schools have agreements to accept students from those states. The source of qualified oral health workforce extends beyond dental schools. Academic dental institutions are located in every state. For example, at present there are 731 residency training programs, 348 at dental schools and 383 at nondental school sites such as hospitals. These programs include 417 dental specialty programs, 230 General Practice Residency programs, and eighty-four Advanced Education in General Dentistry residency training programs in the United States. There are over 260 dental assisting and over 260 dental hygiene programs across the nation. As of 1999/2000, there were thirty-three dental laboratory technology programs accredited by the ADA Commission on Dental Accreditation in twenty-three states.⁴⁸

What are the responsibilities of academic dental institutions, in particular, dental schools, in ensuring a workforce of quality, size, composition, and distribution such that it has the capability of meeting the oral health requirements of all groups of society? While dental schools are a national resource, individually, the schools have a tendency to supply specific states with their dental workforce. Thus dental schools manage the supply of dentists and influence the availability of care and access to care primarily in the areas they supply with dentists. Anticipating and meeting workforce requirements and addressing disparities in access to care can best be approached by schools if they understand the

workforce requirements of the areas they primarily supply, anticipate the resources necessary to fulfill expectations, and give leadership to the initiatives essential to achieving workforce goals over which they have a sense of responsibility and control. Allied dental education programs are likewise positioned to monitor workforce requirements in the areas they serve. Dental specialty programs and advanced programs must give careful attention to national trends, working closely with their parent institutions, the practicing community, accrediting bodies, and other stakeholders to meet the need for providers.

Traditionally, the primary focus of dental education has been to prepare students to enter a private practice dental office. As academic dental institutions consider future workforce requirements, the curriculum should be examined in the light of different points of entry into dental practice. Such a process should include education about the needs of special groups such as the very young, the aged, and the mentally and physically disabled, the medically compromised, and the underserved. Increased attention must be given to rendering culturally competent care. The process should involve strong guidance in the professional socialization of future practitioners and should encourage students to practice in underserved areas and to participate in outreach programs and community service.⁴⁹ Learning about public health issues and the development of public health competencies are important components of the educational experience.¹⁷ Practical steps include exposing students to the delivery of care in a community-based setting as early as possible in the educational process. Ideally, these community-based programs are a part of an integrated health system involving dental teams and non-traditional providers such as primary care physicians and nurses.

The Patient Care Mission of Academic Dental Institutions

Patient care is a distinct mission of academic dental institutions. Academic dental institutions—dental schools, hospital-based and other advanced dental education programs not based in dental schools, and allied dental education programs—have played and will continue to play a vital role in reaching the underserved. A 1998 survey by the ADA confirmed dental schools as leaders in providing care to underserved populations. The mission of nearly 97

percent of the schools who responded to the survey included service to the community. Approximately 41 percent of patients seen in dental school clinics, including school-based and community-based clinics, were under the age of fourteen. Fifty percent of dental school clinic patients were covered by a public assistance program such as Medicare or Medicaid, and another 32 percent did not have private insurance. The majority of patients came from families whose annual income was estimated at \$15,000 or below. The most frequently reported special population group receiving care at dental school clinics was low-income individuals, followed by individuals with mental, medical, or physical disabilities.⁵⁰

Residency training clinics are a major source of dental services for underserved populations. The regulations that govern Graduate Medical Education (GME) funding for the training and education of dental residents in outpatient clinics also allow funding for stipends, benefits, and teaching costs for residents that work in community clinics. Currently, there are electronic distance education curricula under development that would allow community clinics to offer accredited programs without the need to develop a complementary didactic program, creating additional residency positions. Dental schools should encourage graduates to pursue a year of service and learning that would not only make the students more competent to provide increasingly complex care, but also serve to improve access to oral health care. ADEA should work with other organizations to advocate for a requirement that all dental graduates participate in a year of service and learning in an accredited PGY-1 program.

If regulatory bodies move further toward legislation that supports a year of postdoctoral education, as has recently happened in the state of New York, most of the new residency positions are likely to be created in community health centers, including rural health clinics, county health departments, and similar public health programs. These entities are a major source of oral health care for underserved populations. Dental education leaders must frequently inform and remind state legislatures of the importance of residency training in clinics where traditionally underserved populations seek care. ADEA, other organized dental associations, and academic dental institutions must continue to advocate for funding to increase dental residency positions and for loan forgiveness to ease the financial burden for dental graduates participating in these programs.

Oral health care at academic dental institutions has grown from care incidental to students gaining clinical competence in a variety of entry-level procedures to the institutions serving as providers of comprehensive dental care. As with medical schools and other parts of the academic health center, efficiently delivered patient-centered care is necessary for academic dental institutions to compete for and retain a patient pool for students and residents and to improve clinic and institutional productivity and revenues. At many academic dental institutions, patient care is a mandated responsibility of the parent institution as they are expected to contribute more directly to the benefit of the community as a whole, in part as exchange for the amounts of public dollars received from state and federal sources and in part of fulfilling the public trust society has granted the health professions. Academic dental institutions have moved to more efficient patient management systems, to greater use of off-site clinic facilities and community-based programs of care, and an increased responsiveness to societal priorities.

As academic dental institutions consider their patient care mission, there is one important caveat that they, the dental profession, policymakers, and other stakeholders must carefully consider: academic dental institutions alone cannot solve the access to care problems. Partners in addressing access must necessarily include the private practice community, community health centers, and state and federal policymakers. The role of academic dental institutions as a safety net should not diminish their academic purpose. Academic dental institutions have the unique role in society of educating oral health professionals, generating new knowledge, conducting and promoting basic and applied research, and providing patient care to advance education, research, and service to their communities. If forced to choose between their academic mission and their role as a safety net for the underserved, academic dental institutions must put more effort into their academic mission than in improving access. As a safety net for the underserved, academic dental institutions can be supported and even replaced by nonacademic providers and institutions. What others cannot replace is the defining academic purpose that dental schools and advanced dental education programs play in our society.

Improving Access Through a Diverse Workforce

The race and ethnic composition of the U.S. population is projected to change significantly over

the next fifty years. By the middle of this century, the Black/African American population will increase from 12.1 to 13.6 percent, and the Native Americans will increase from 0.7 to 0.9 percent. Asian/Pacific Islanders will increase from 3.5 to 8.2 percent. The most significant increase will be in the Hispanic/Latino population, from 10.8 to almost 25 percent of the U.S. population. The White/Caucasian population will decline from about 73 to 53 percent.⁵¹ Currently, about 14 percent of professionally active dentists are non-white: almost 7 percent are Asian/Pacific Islander; 3.4 percent are Black/African American; 3.3 percent are Hispanic/Latino; and 0.1 percent are Native American. About 30 percent of dentists under the age of forty are non-white. However, less than one-half of these minority dentists under forty years of age are Black/African American, Hispanic/Latino, or Native American.⁵²

With these projected demographic changes, our society will need to take measures to ensure that the health care workforce is prepared to care for a more diverse population. That we are currently ill prepared to take care of the needs of an increasingly diverse society is reflected in a recent study by the Institute of Medicine (IOM). The IOM study found that racial and ethnic minorities generally receive lower quality health care than whites do, even when they have comparative insurance, income, age, and severity of conditions.⁵³ These findings go beyond conclusions about the impact of lower socioeconomic status on the health care of minorities found in the Surgeon General's report on oral health and Healthy People 2010 to signify a much larger problem.^{1,2} Possible reasons for these disparities include an inequitable health care system, cultural differences resulting in different rates of utilization, and lack of cultural competence among providers to care for a diverse patient pool.

Physician studies have shown that minority physicians can improve access to medical care and are more likely than white physicians to practice in communities where physician shortages exist and to treat minority and poorer patients.⁵⁴ Data from the ADA corroborate that minority dentists are more likely to care for minority patients (Table 2). Presumably, minority patients are more comfortable seeing providers of the same ethnic and racial group. Perhaps this level of comfort is found in the ability of minority providers to give more culturally sensitive care. Assuming that increasing the number of minority health care providers will increase the use of health care services by minority groups,⁵⁴⁻⁵⁷ actions

Table 2. Dentists and patients by race/ethnicity

Patients:	White	Hispanic	Black	Asian
<i>Dentists:</i>				
White	76.6%	8.5%	10.5%	3.2%
Hispanic	43.6%	45.4%	9.8%	3.0%
Black	27.0%	7.9%	61.8%	2.3%
Asian	47.5%	14.5%	11.5%	25.1%

Source: ADA, 1996 Dentist Profile Survey

must be taken to secure the oral health of the nation in the decades to come through a diverse workforce.

While the percentage of minority dental students has significantly increased since 1980, from about 13 to 34 percent, this increase is primarily due to the growth in the number of Asian/Pacific Islander students. The number of Asian/Pacific Islander students grew from 5 percent of first-year enrollees in 1980 to nearly 24 percent of the 1999 first-year enrollees. The number of underrepresented minorities, defined as racial and ethnic populations that are underrepresented relative to the number of individuals who are members of the population involved,⁵⁸ has grown less than three percentage points during the same time period. Year 2000 saw slight increases in the underrepresented minority student enrollment for both Black/African American (4.79 percent from 4.68 percent in 1999) and Hispanic (5.33 percent from 5.28 percent in 1999) students.⁵⁹ The only group that approached parity with its representation in the U.S. population is Native Americans. In 2000 this group was 0.65 percent of dental enrollment and 0.7 percent of the U.S. population.

Converting the percentage of minority composition of first-year enrollment to the actual number of minority first-time enrollees presents an alarming trend in minority student representation. During the decade of the 1990s, there was a 15 percent decline in the number of underrepresented minority first-year students. In particular, the number of Black/African American students fell 19 percent, from 215 to 174. The number of Hispanic/Latino students fell 16 percent, from 245 to 205. This trend, juxtaposed with the projected racial and ethnic demographics of the United States in fifty years, indicates urgent measures are needed to build a diverse oral health workforce.

Removing Barriers to a More Diverse Workforce

Current ADEA policy strongly endorses the continuous use of recruitment, admission, and re-

tention practices that achieve excellence through diversity in American dental education.⁶⁰ However, in spite of concerted efforts to recruit underrepresented minorities to careers in dentistry, there has been little increase in the size of the underrepresented minority dental applicant pool over the last ten years. The challenge is made difficult because of a lower proportion of underrepresented minorities in post-secondary institutions, which in turn is caused by lower high school completion rates, attendance at primary and secondary schools with poor academic standards, lack of preparation in science and math, too few mentors, and the lack of access to other educational and career opportunities.

There are a myriad of other factors that create barriers for underrepresented minorities to enter dentistry. For example, the number of Black/African American and Hispanic/Latino oral health professionals, including dentists and allied dental personnel, is so small as to provide little exposure to the dental profession and even less chance for mentorship at an early age. Because many Black/African American, Hispanic/Latino, and Native American families are unfamiliar with the dental profession, the image of dentistry as a career fails to attract young people from these ethnic and racial groups. Competition is keen among all the professions for academically qualified underrepresented minorities, resulting in aggressive recruitment for the best students. The small number of minority faculty combined with little-to-no Black/African American, Hispanic/Latino, and Native American representation in many dental education schools and programs dissuades some potential students. The cost of dental education is also a barrier for many. In 2001, the average indebtedness of dental graduates, \$113,000,⁶¹ exceeded that of medical graduates, approximately \$104,900.⁶² Admissions requirements sometimes create unnecessary barriers because they have traditionally been based upon restrictive policies rather than policies that are predictive of the diversity of practitioners needed to meet the needs of a diverse population. Future admissions practices should be consistent with sustaining a commitment to a diverse student body, diversity in the health professions, and thereby to ensuring access to oral health care for all Americans.⁵⁹

ADEA is currently pursuing a variety of strategies to increase the recruitment and retention of underrepresented minority students and faculty. The 2002 \$1 million grant from the W.K. Kellogg Foundation to administer the W.K. Kellogg/ADEA Ac-

cess to Dental Careers (ADC) Program is an exemplary partnership to increase underrepresented minority representation in dental schools. The ADC program will provide institutional grants to RWJF Pipeline, Profession, and Practice Program: Community-Based Dental Education grantees and will supplement the underrepresented minority recruitment and retention component of the RWJF program.^{45,63} Hopefully, other foundations will consider funding similar initiatives. ADEA, the ADA, the National Dental Association, the Hispanic Dental Association, and the Society of American Indian Dentists must work collaboratively to secure more funding from federal sources as well. For example, federal funding for Title VII programs including the Faculty Loan Repayment Program and the Minority Faculty Fellowship Program should be increased. Partnerships with business and industry to develop scholarships, loan forgiveness, and recognition awards provide additional opportunities.

Among the strategies that require more attention are the early identification and development of students who are likely to pursue careers in the health professions. Major efforts are needed to strengthen the academic pipeline. National organizations must explore the development of a database of students who are successful achievers in math and science. Model programs such as the National Science Foundation program that focuses on strengthening math and science skills of middle and high school students should be duplicated. The Bureau of Health Professions' Health Careers Opportunity Program (HCOP), Centers of Excellence (COE), and the Kids into Health Careers Program provide excellent opportunities to inform minority and economically disadvantaged students and parents about careers in the health professions. Ultimately, these programs should improve overall access to health for underrepresented minorities and other disadvantaged populations by increasing the minority applicant pool for health professions education. Academic dental institutions can promote dentistry through outreach and involvement of children and youth in their communities through early contact programs.

Each academic dental institution can help identify and share strategies in mentoring, recruitment, minority faculty development, admissions process review, and cultivating a better image of oral health professions among minority youth. Academic dental institutions and national dental associations in cooperation with partnering organizations, including other health professions organizations at the national,

state and local levels, private foundations, special interest and advocacy groups such as the National Congress of Black Churches, the Congressional Hispanic Caucus, the Congressional Black Caucus, the National Association for the Advancement of Colored People, public education, and the federal and state governments must continue to promote the value of diversity as related to quality of care, to inform minority groups about the opportunities and rewards of a career in oral health care, and to encourage minority youth to prepare for and apply to dental school and other academic dental programs. Finally, as academic dental institutions, the practicing community, other stakeholders in the delivery of health care, and their national organizations interact with policymakers at both the state and federal level, there continues to be a need to reframe the argument for affirmative action based on serving the common good.

Types of Oral Health Providers

According to the Bureau of Labor Statistics, dental assistants held about 229,000 jobs in 1998.⁶⁴ The U.S. Department of Health and Human Services estimates that there are nearly 141,000 licensed dental hygienists in the United States.⁶⁵ The National Association of Dental Laboratories' "mid-range estimate" is 48,000 for the number of dental laboratory technicians.⁶⁶ The Center for Health Workforce studies projects nearly a 30 percent growth rate in health care occupations between 2000 and 2010. However, the growth rate for dentists during this time is projected at only 5.7 percent; in contrast, dental hygienist jobs are predicted to grow by 37 percent.⁶⁷ As policymakers consider future dental workforce needs in the light of growing access to oral health problems, they will invariably look to the declining dentist to population ratio and new roles for both traditional and nontraditional providers of oral health care.

The current oral health workforce has reserve productive capacity through the utilization of allied dental professionals. As the ratio of dentists to population declines and as the demand for or need of dental services increases, in the national aggregate or through programs to underserved population groups or areas, there will be a need to draw upon this reserve capacity and even expand productive capacity through a more extended use of allied dental professionals. Tapping into this reserve capacity must not

only include a more intensive utilization of allied dental personnel, but the examination of new roles and responsibilities, in a less restrictive delivery system, that would further augment the output of the dental team and extend the availability of oral health care. As has been well documented, extended utilization of allied health personnel is one way to increase the efficiency of health care delivery and the availability of care.^{26,68-73}

Regulatory Considerations for Improving Access to Oral Health Care

Forty-nine states allow dental hygienists to provide services under general supervision in some settings. General supervision requires that a dentist authorize a dental hygienist to perform procedures, but his or her presence is not mandatory in the treatment facility during the delivery of care. With the variation in individual state practice acts, the definition of general supervision varies widely, as do the services that dental hygienists are allowed to perform. In some states, dental hygienists can practice only under direct supervision, that is, a dentist must be present in the facility while the dental hygienist provides care. In fourteen states, dental hygienists may provide care in certain settings under various forms of unsupervised practice and less restrictive supervision.¹¹

In California, dental hygiene practice is expanded through special license designations of a Registered Dental Hygienist in Alternative Practice (RDHAP). Unsupervised practice means that dental hygienists can assess patient needs and treat the patient without the authorization or presence of a dentist.²⁷ RDHAPs are indicative of a new type of oral health care provider. Special requirements for RDHAPs include a bachelors degree or equivalent, three years clinical practice, and completion of a 150 clock hour special course and exam. Other states with less restrictive supervision are instructive of ways in which allied dental professionals, especially dental hygienists, can provide oral health care in underserved settings (Table 3).

One of the major challenges to full utilization of allied dental professionals is state laws and regulations that limit practice settings and impose restrictive supervision requirements. The level of supervision should reflect the education, experience, and

competence of the allied dental professional. At present, many state practice acts do not reflect what allied dental professionals have been educated to do competently. While academic dental institutions cannot themselves effect a change in the laws and regulations, they are often positioned to influence the elimination of regulatory language that unnecessarily restricts the services provided by allied dental professionals. More specifically, the leadership of academic dental institutions is positioned to inform legislative leaders and state board members about ways that dental assistants, dental hygienists, and dental laboratory technicians can contribute to alleviating the access to oral health care problems in their communities and states.

To ensure the competence of allied dental professionals, the academic dental education community must continue to support accredited programs, nationally recognized certification for dental assistants and dental laboratory technicians, and licensure for dental hygienists.

As pressure mounts on policymakers to improve access to oral health care, it is likely that state practice acts will become less restrictive, especially for dental hygienists who have graduated from accredited programs and are licensed. Academic dental institutions, including those community and technical colleges, should monitor how these developments are evolving in the states they serve. Educational programs should anticipate these changes so that allied dental graduates will be prepared to provide expanded care in unconventional settings. For example, dental hygienists should be prepared to assume new roles as oral health educators, providing educational services, oral health training programs, and oral health screenings without supervision. Dental hygienists have new roles to play in the treatment of periodontal disease. Dental assistants should carry out extended functions that can further increase the productivity of the dental team and facilitate access to oral health care. Dental laboratory technicians must be prepared for emerging roles in the light of scientific advances in biomimetics and bioengineering. The evolving roles of allied dental professionals underscore the need for quality education through accreditation and the recognition of professional competence through certification and licensure.

The significance of the federally funded "Training and Expanded Auxiliary Management" (T.E.A.M.)⁷⁴ in the 1970s has largely been lost. However, even as many state practice acts change to allow less restrictive supervision, dental professionals

Table 3. Examples of states with less restrictive supervision for dental hygienists

California. RDHAPs may work as an employee of another RDHAP who is an independent contractor or sole proprietor of an alternative dental hygiene practice. An RDHAP may practice in residences of the homebound, schools, residential facilities, and other institutions, as well as in dental health professional shortage areas. New legislation (California SB1589) would authorize RDHAPs to be an employee of a primary care clinic or specialty clinic, a clinic owned or operated by a public hospital or health system, and a clinic owned and operated by a hospital that maintains the primary contract with a county government.

Colorado. Dental hygienists may engage in unsupervised practice in all settings for all licensed dental hygienists for prophylaxis and several other services, including: removal of deposits, accretions, stains, curettage, application of fluorides and other recognized preventive agents, oral inspection and charting, and topical anesthetic.

Connecticut. Dental hygienists with two years experience may practice without supervision in institutions, public health facilities, group homes, and schools. Services include: complete prophylaxis, removal of deposits, accretions and stains, root planing, providing sealants, and assessment and treatment planning.

New Mexico. Collaborative practice is permitted based on a written agreement between the dental hygienist and one or more consulting dentists. Dental hygienists may treat patients according to an agreed-upon protocol of care with the collaborating dentist. The protocol is equivalent to standing orders that permit the dental hygienist to provide such services as preliminary assessment, x-rays, prophylaxis, and fluoride treatment. Case-by-case approval is given for procedures such as sealants and root planing.

Oregon. Dental hygienists may initiate service for patients in limited access settings such as extended care facilities, correctional facilities, facilities for the disabled or mentally ill, schools and preschools, and job training centers. The dental hygienist with a limited access permit can perform all dental hygiene services, with the exception of several services that must be authorized by a dentist.

Washington. Unsupervised practice by dental hygienists is permitted in hospitals, nursing homes, home health agencies, group homes for the elderly, handicapped, or youth, state institutions under department of health and human services, jails, and public health facilities, provided that the hygienist refers to a dentist for dental treatment and planning.

Source: American Dental Hygienists' Association, Division of Governmental Affairs, July 2002

will be most effective as they contribute to an integrated oral health team. The attitudes and behaviors of superior team performance are learned best in the context of the provision of care with other health care professionals. Interdisciplinary courses and activities, especially with dental students and even with nontraditional providers such as physicians and other primary care providers, and greater involvement in community health care delivery systems are critical steps to prepare the future allied dental workforce. Students should experience integrated care in an efficient delivery system.

Nontraditional Providers of Oral Health Care

In commenting on the need for dental education's leadership for the common good, DePaola observes, "Oral health professionals often fail to achieve improvements in the oral health of the community because they are not provided or lack the skills necessary to share their knowledge and expertise with those beyond the dental office, the dental school, or the university."³⁶ Reduced access to oral health care is one of the prices of professional isolation that has too often characterized dentistry. Isolation gives the

impression to other health professionals, policy-makers, and the public that oral health is not as important as general health. Integration into the health care system is a fundamental step toward improving access to oral health care. Dental services must be accessible, affordable, and valued by the underserved. Primary care practice is the front line for underserved populations and *potentially* serves to provide dental screening, prevention, education—and referrals to dentists and allied oral health professionals. A recent report by the HRSA Advisory Committee on Training in Primary Care Medicine and Dentistry observes that two-thirds of all Americans interact with a primary care provider every year.⁷⁵ Family physicians, pediatricians, other primary care physicians, nurse practitioners, and physician assistants should be enlisted to monitor the oral health of their patients. However, at present the medical community is neither sufficiently conversant with oral health nor adequately integrated with their dental colleagues to effect significant change on the status of oral health.

Of the fifty-five accredited U.S. dental schools, forty-four are part of academic health centers. Residency training programs, specialty programs, General Practice Residency and Advanced Education in General Dentistry programs, and allied programs are well ensconced in a variety of settings that provide opportunities for interaction with other health pro-

fessions. Academic dental institutions are thus well positioned to educate other health professionals about oral health. One way to foster this integration is to provide students with clinical experiences in public dental clinics that are integrated into larger medical clinics. Dental schools could initiate interaction among dental and medical students and other primary care practitioners not merely in the basic sciences, but also in clinical practice. Not only must primary care medical practitioners learn to be a part of the oral health team; dentists must become more involved in assessing the overall health of their patients through screening, diagnosis, and referral. Meeting the access to oral health care challenge will require collaboration across the health professions.

Summary of Roles and Responsibilities

Where dental education and dental practice are today was influenced and much determined by decisions made fifteen years ago. Where dental education and dental practice will be and wish to be fifteen years from now is influenced and much determined by decisions made today. With the length of time required for developing new models of oral health care delivery, program planning, development, implementation, and training, effecting change can easily take ten years. The uncertainties of workforce requirements remain, along with the issues of workforce composition and distribution that affect the availability of and access to oral health care, which contribute to disparities of oral health status. Decisions must be made now to guide the develop-

ment of dental education policy, position, and action regarding the number, diversity, and type of oral health care providers and roles and responsibilities of academic dental institutions in patient care and improving access to oral health care.

With the communities of dental education, regulation, dental practice, and other health professions working together, in conjunction with public and private policymakers and partners, the oral health care needs of the underserved will be met, thereby ensuring access to quality oral health care for all Americans. In summary, academic dental institutions can work to this end most effectively by discharging these roles and responsibilities:

- Preparing competent graduates with skills and knowledge to meet the needs of all Americans within an integrated health care system;
- Teaching and exhibiting values that prepare the student to enter the profession as a member of a moral community of oral health professionals with a commitment to the dental profession's societal obligations;
- Guiding the number, type, and education of dental workforce personnel to ensure equitable availability of and access to oral health care;
- Contributing to ensure a workforce that more closely reflects the racial and ethnic diversity of the American public;
- Developing cultural competencies in their graduates and an appreciation for public health issues;
- Serving as effective providers, role models, and innovators in the delivery of oral health care to all populations; and
- Assisting in prevention, public health, and public education efforts to reduce health disparities in vulnerable populations.

Recommendations for Improving the Oral Health Status of All Americans: Roles and Responsibilities of Academic Dental Institutions

1. To monitor future oral health care workforce needs:

- 1.1 As a part of each academic dental institution's strategic plan, include an assessment of the dental workforce status and requirements of the areas primarily served by the institution. Conduct of the assessment should include representation from state and local dental and allied dental societies, appropriate federal, state, and local health departments, educators from pre- and postdoctoral and allied academic dental institutions, and other strategic partners. The assessment and resulting plan should consider: the age, gender, retirement, and replacement characteristics of the current workforce; population demographics and trends; underserved populations and communities; and understaffed facilities that serve such populations and communities.
- 1.2 Collaborate with state and local dental and allied dental societies to advocate jointly for federal and state funds and programs that will assist academic dental institutions in meeting projected workforce number and composition requirements, along with incentives and programs designed to achieve a more equitable distribution of and access to oral health care.
- 1.3 Engage in health services research through the Agency for Health Research and Quality to gather information on utilization, cost, cost-effectiveness, outcomes of treatment, measurement of disease, and health outcomes. Develop measures for oral health status, including measures specific to gender, ethnic and racial groups, the elderly, children, and medically compromised patients.

2. To improve the effectiveness of the oral health care delivery system:

- 2.1 Develop and support new models of oral health care that will provide care within an integrated

health care system. New models should involve other health professionals, including family physicians, pediatricians, geriatricians, and other primary care providers as team members. These models should also expose students to different points of entry into dental practice such as public health, hospitals, community health, academics, and other opportunities.

- 2.2 Educate dental and allied dental students to assume new roles in the prevention, detection, early recognition, and management of a broad range of complex oral and general diseases and conditions in collaboration with their colleagues from other health professions.
- 2.3 Advocate for stronger linkages among primary care dentistry, primary care medicine, and public health through interdisciplinary faculty training. Faculty development funding should be made available through dental programs under Title VII, Section 747.
- 2.4 Convene through ADEA a task force of health professions leaders from medicine, dentistry, the allied dental professions, public health, nursing, and related areas to develop a process for integrating didactic and clinical oral health curricula into medical and other health professions education.
- 2.5 Promote the adoption of the *Healthy People 2010* Oral Health Objectives in the communities of which the academic dental institution is a part. Involve community health centers, communities of faith, public school health personnel, nursing home health personnel, and local health care professionals in the pursuit of these objectives.
- 2.6 Encourage minority students and faculty to pursue advanced education and research training opportunities and research supplements for minority investigators through the National Institute for Dental and Craniofacial Research and other federal, state, and private programs.
- 2.7 Work closely with the ADA, the American Dental Hygienists' Association, the Hispanic Dental Association, the National Dental Association, and the Society of American Indian Dentists to advocate for increased funding for Medicaid and State Children's Health Insurance Programs.
- 2.8 Advocate for increases in federal Medicaid payments to compensate for state cutbacks, improve care, and lessen the access problems of the uninsured.

- 2.9 Enhance interdisciplinary education opportunities by integrating medical and dental education through problem-based learning, team building, and grand rounds involving cross disciplinary students and a variety of primary care providers.
- 2.10 Work closely with the ADA and other organizations to advocate for increased funding and loan forgiveness for General Practice Residency and Advanced Education in General Dentistry programs and dental specialty programs, particularly pediatric dentistry and dental public health programs, so that the number of positions and funding are sufficient for a requirement that all dental graduates participate in a year of service and learning in an accredited PGY-1 program.
- 2.11 Maintain and seek increased federal funding for dental Graduate Medical Education (GME), and develop relationships with hospitals to increase dental residency training positions reimbursed through the GME program.
- 2.12 Encourage all dental graduates to pursue postdoctoral dental education in a general dentistry or advanced dental education program and continue to monitor the feasibility of requiring a year of advanced education for all dental graduates. Work with other organizations to advocate for a requirement that all dental graduates participate in a year of service and learning in an accredited PGY-1 program.

3. To prepare students to provide oral health services to diverse populations:

- 3.1 Facilitate interaction between students and faculty and community leaders from different ethnic and racial backgrounds in forums to discuss the importance of oral health care and the perceptions of the respective communities.
- 3.2 Incorporate cultural competency concepts in all aspects of the clinical instruction curriculum.
- 3.3 Provide in the curriculum and in other forums opportunities to teach students about their professional obligation to serve the public good and encourage students to explore how they and the profession can ensure oral health care for all Americans.
- 3.4 Provide rotations in off-site clinics to deliver oral health care to underserved populations as a means to develop culturally competent oral health providers.

- 3.5 Encourage the ADA Commission on Dental Accreditation to add an accreditation standard addressing cultural competency and to include cultural competency in its curriculum survey so that data on outcomes can be collected.
- 3.6 Advocate for adequate curriculum time devoted to theoretical and practical considerations in providing care to patients with complex needs and circumstances, including those with developmental and other disabilities, the very young and the aged, and individuals with complex psychological and social situations. Include didactic and clinical educational experiences.
- 3.7 Foster collaboration between pre- and postgraduate educational institutions to develop a continuum of educational experiences in the care of patients with complex needs.
- 3.8 Work with the ADA Commission on Dental Accreditation to adopt or strengthen accreditation standards at all levels of dental education related to competency in treatment of people with special needs. Include a requirement that graduates of dental education programs be able to manage or treat, consistent with their educational level, a variety of patients with complex medical and psychosocial conditions, including those with developmental and other disabilities, the very young, the aged, and individuals with complex psychological and social conditions.

4. To increase the diversity of the oral health workforce:

- 4.1 Expose minorities to careers in oral health at an early age. Develop dental school programs and allied dental education programs that promote dentistry through outreach and involvement of children, youth, and undergraduate students in the community through pre-admission programs and other early contact programs. The HRSA *Kids Into Health Careers* program, Centers of Excellence, and Health Careers Opportunities programs should be supported, particularly for implementation at the local level.
- 4.2 Through ADEA, identify and publish best practices in the recruitment and retention of underrepresented minority students and faculty.
- 4.3 Explore best practices in distance learning and develop programs that will provide much of the student's education in the community in

which he or she lives. Successful models currently exist in dental hygiene education that should be studied for application to other dental education programs in community and technical colleges and in dental schools.

- 4.4 Review and amend admissions criteria in the context of the common good and the importance of educating a diverse workforce to meet the oral health needs of an increasingly diverse society.
- 4.5 Expand funding for scholarships and loans for underrepresented minorities from federal, state, and private sources.
- 4.6 Through ADEA, work closely with the ADA, the American Dental Hygienists' Association, the Hispanic Dental Association, the National Dental Association, and the Society of American Indian Dentists to develop mentoring programs to formalize interactions between minority dentists and youth. Include outcome measures.

5. To improve the effectiveness of allied dental professionals in reaching the underserved:

- 5.1 Develop the knowledge and skills necessary to serve a diverse population, provide experiences of oral health care delivery in community-based and nontraditional settings, and encourage externships in underserved areas.
- 5.2 Advocate for statutory and regulatory reform to ensure that state practice acts do not unnecessarily restrict the care that allied dental professionals who have graduated from accredited programs and, in the case of dental hygienists, hold the appropriate license, to provide care to the public.
- 5.3 Continue to support accredited allied dental programs as the educational standard for entry into the profession.
- 5.4 In each state, monitor and anticipate changes in supervision requirements for allied dental professionals and modify the curriculum and extramural experiences of students so as to prepare them to provide more extended services in a variety of practice settings.
- 5.5 Engage students in the local community to provide oral health promotion and disease prevention education to children and parents in underserved groups. Settings should include schools, nursing homes, community activity centers.

Acknowledgment

ADEA thanks the William J. Gies Foundation for the Advancement of Dentistry for its generous support of the ADEA Commission on Improving the Oral Health Status of All Americans. The views expressed in this report are those of the ADEA Commission on Improving the Oral Health Status of All Americans and are not intended to represent the position of the William J. Gies Foundation.

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Appendix 1. From the 2000 Surgeon General's Report on Oral Health: The Burden of Oral Diseases and Disorders

Oral diseases are progressive and cumulative and become more complex over time. They can affect our ability to eat, the foods we choose, how we look, and the way we communicate. These diseases can affect economic productivity and compromise our ability to work at home, at school, or on the job. Health disparities exist across population groups at all ages. Over one third of the U.S. population (100 million people) has no access to community water fluoridation. Over 108 million children and adults lack dental insurance, which is over 2.5 times the number who lack medical insurance. The following are highlights of oral health data for children, adults, and the elderly. (Refer to the full report for details of these data and their sources.)

Children

- Cleft lip/palate, one of the most common birth defects, is estimated to affect 1 out of 600 live births for Whites and 1 out of 1,850 live births for African Americans.
- Other birth defects such as hereditary ectodermal dysplasias, where all or most teeth are missing or misshapen, cause lifetime problems that can be devastating to children and adults.
- Dental caries (tooth decay) is the single most common chronic childhood disease—5 times more common than asthma and 7 times more common than hay fever.
- Over 50 percent of 5- to 9-year-old children have at least one cavity or filling, and that proportion increases to 78 percent among 17-year-olds. Nevertheless, these figures represent improvements in the oral health of children compared to a generation ago.
- There are striking disparities in dental disease by income. Poor children suffer twice as much dental caries as their more affluent peers, and their disease is more likely to be untreated. These poor-nonpoor differences continue into adolescence. One out of four children in America is born into poverty, and children living below the poverty line (annual income of \$17,000 for a family of four) have more severe and untreated decay.
- Unintentional injuries, many of which include head, mouth, and neck injuries, are common in children.
- Intentional injuries commonly affect the craniofacial tissues.
- Tobacco-related oral lesions are prevalent in adolescents who currently use smokeless (spit) tobacco.
- Professional care is necessary for maintaining oral health, yet 25 percent of poor children have not seen a dentist before entering kindergarten.
- Medical insurance is a strong predictor of access to dental care. Uninsured children are 2.5 times less likely than insured children to receive dental care. Children from families without dental insurance are 3 times more likely to have dental needs than children with either public or private insurance. For each child without medical insurance, there are at least 2.6 children without dental insurance.
- Medicaid has not been able to fill the gap in providing dental care to poor children. Fewer than one in five Medicaid-covered children received a single dental visit in a recent year-long study period. Although new programs such as the State Children's Health Insurance Program (SCHIP) may increase the number of insured children, many will still be left without effective dental coverage.
- The social impact of oral diseases in children is substantial. More than 51 million school hours are lost each year to dental-related illness. Poor children suffer nearly 12 times more restricted-activity days than children from higher-income families. Pain and suffering due to untreated diseases can lead to problems in eating, speaking, and attending to learning.

Adults

- Most adults show signs of periodontal or gingival diseases. Severe periodontal disease (measured as 6 millimeters of periodontal attachment loss) affects about 14 percent of adults aged 45-54.
- Clinical symptoms of viral infections, such as herpes labialis (cold sores), and oral ulcers (canker sores) are common in adulthood, affecting about 19 percent of adults 25 to 44 year of age.
- Chronic disabling diseases such as temporomandibular disorder, Sjögren's syndrome, diabetes, and osteoporosis affect millions of Americans and compromise oral health and functioning.
- Pain is a common symptom of craniofacial disorders and is accompanied by interference with vital functions such as eating, swallowing, and speech. Twenty-two percent of adults reported some form of oral-facial pain in the past 6 months. Pain is a major component of trigeminal neuralgia, facial shingles (post-herpetic neuralgia), temporomandibular disorder, fibromyalgia, and Bells' palsy.
- Population growth as well as diagnostics that are enabling earlier detection of cancer means that more patients than ever before are undergoing cancer treatments. More than 400,000 of these patients will develop oral complications annually.
- Immuno-compromised patients, such as those with HIV infections and those undergoing organ transplantation, are at higher risk for oral problems such as candidiasis.
- Employed adults lose more than 164 million hours of work each year due to dental disease or dental visits.
- For every adult 19 years or older without medical insurance, there are three without dental insurance.
- A little less than two thirds of adults report having visited a dentist in the past 12 months. Those with incomes at or above the poverty level are twice as likely to report a dental visit in the past 12 months as those who are below the poverty level.

Older Adults

- Twenty-three percent of 65- to 74-year-olds have periodontal disease (measured as 6 millimeters of periodontal attachment loss). Also, at all ages men are more likely than women to have more severe disease, and at all ages people at the lowest socioeconomic levels have more severe periodontal disease.
- About 30 percent of adults 65 years and older are edentulous, compared to 46 percent 20 years ago. These figures are higher for those living in poverty.
- Oral and pharyngeal cancers are diagnosed in 30,000 Americans annually; 8,000 die from these diseases each year. These cancers are primarily diagnosed in the elderly. Prognosis is poor. The 5-year survival rate for white patients is 56 percent; for blacks, it is only 34 percent.
- Most older Americans take both prescription and over-the-counter drugs. In all probability, at least one of the medications will have an oral side effect—usually dry mouth. The inhibition of salivary flow increases the risk for oral disease because saliva contains antimicrobial components as well as minerals that can help rebuild tooth enamel after attack by acid-producing, decay-causing bacteria. Individuals in long-term care facilities are prescribed an average of eight drugs.
- At any given time, 5 percent of Americans aged 65 and older (currently some 1.65 million people) are living in a long-term care facility where dental care is problematic.
- Many elderly individuals lose their dental insurance when they retire. The situation may be worse for older women, who generally have lower incomes and may never have had dental insurance. Medicaid funds dental care for the low-income and disabled elderly in some states, but reimbursements are low. Medicare is not designed to reimburse for routine dental care.

Source: U.S. Department of Health and Human Services. Oral health in America: a report of the Surgeon General. Rockville, MD: HHS, National Institutes of Health. National Institute of Dental and Craniofacial Research, 2000.